Course in Agriculture
Farm School
Thompson's Island
Boston, Massachusetts.

1902

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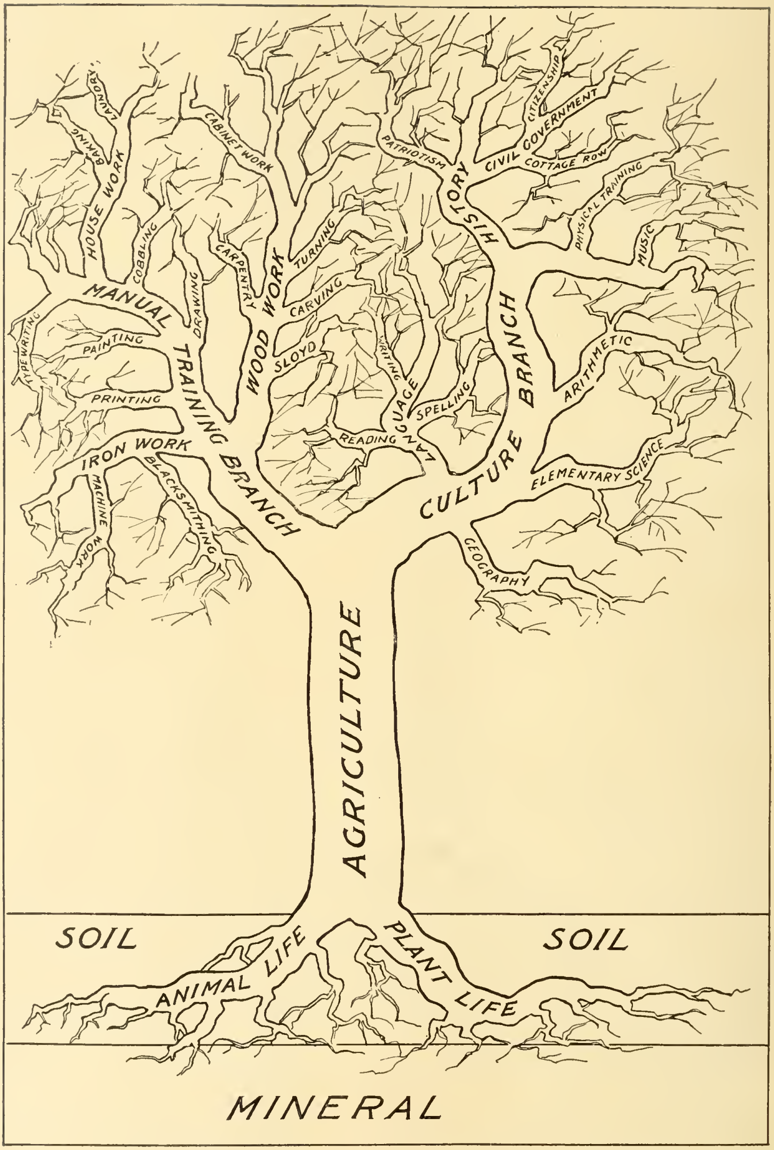

ILLUSTRATING EDUCATION AT THE
FARM SCHOOL
THOMPSON'S ISLAND, BOSTON.

A COURSE IN AGRICULTURE FOR

Elementary Grades

THE BASIS OF THE SCHOOL WORK AT THE
FARM SCHOOL, THOMPSON'S ISLAND,
BOSTON, MASS.

FARM
SCHOOL
PRESS.
1903.

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by
CHARLES H. BRADLEY,
Supt. Farm School.

PREFACE

For many years we have been known as the Farm School and because of the important part which the farm has always taken in the life of the School, we feel that the name is appropriate. All of our boys have, in turn, received simple instruction in the field in the sowing of seed and in the care and harvesting of crops. This has been occasionally supplemented by informal talks on farm subjects in the class room, but there has been no definite instruction in agriculture.

Meanwhile our courses in sloyd, carpentry, forging, printing and other departments of instruction have been developed in accordance with modern methods.

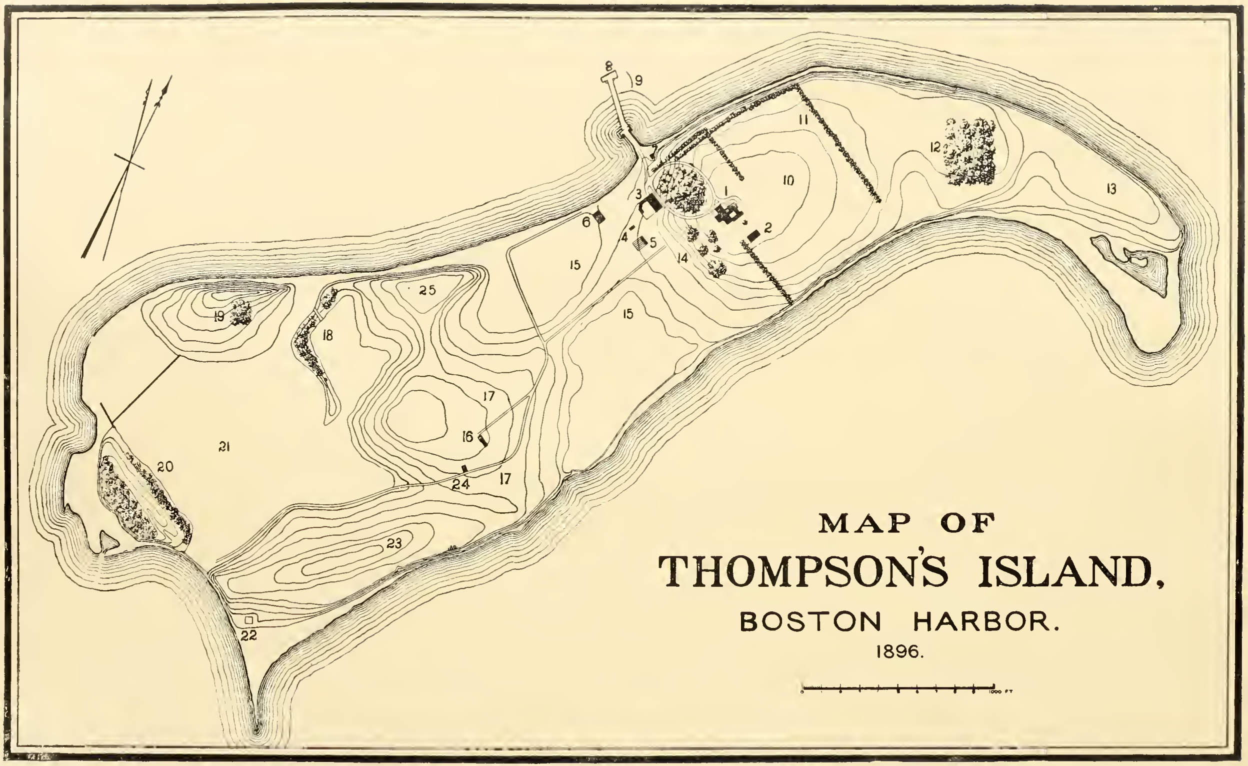
With the intention of giving the farm work the consideration it deserves, we began, a few years ago, to collect material bearing upon this subject. We have been in correspondence with the United States Department of Agriculture and with various agricultural schools, colleges and experiment stations, and have visited some of the leading schools that teach this subject. We have also availed ourselves of valuable information concerning the work done in the elementary schools of Europe, where the teaching of practical agriculture is an important feature.

We have tested the following outline for several seasons and feel that it is well adapted to the conditions of our School. We now present it as the only course in agriculture for the grammar grades, in practical operation in this country.

We wish to take this opportunity of acknowledging the services of Mr. John C. Anthony, Superintendent of Schools of Wareham, Mass., who sifted a large amount of material and formulated this course of study, and of Mr. Arthur M. Vaughan, our instructor and foreman, whose enthusiasm and grasp of the subject have made its practical application a success.

We are also pleased to state that Secretary Wilson, of the United States Department of Agriculture, has highly approved of the course, and of the spirit of the instruction and the results shown at the Farm School.

CHARLES H. BRADLEY, Supt.



MAP OF
THOMPSON'S ISLAND,
BOSTON HARBOR.
1896.

1 Main Building
2 Industrial Building
3 Stock Barn
4 Corn House
5 Poultry House
6 Storage Barn
7 Boat House
8 Wharf
9 Breakwater
10 Playground
11 Cottage Row
12 Bowditch Grove
13 Pasture
14 Fruit Orchard
15 Meadow
16 Farm House
17 Garden
18 Spruce Ridge
19 Oak Knoll
20 Lyman Grove
21 Marsh Meadow
23 Cemetery
23 Mowing
24 Root Cellar
25 Mowing

INTRODUCTION

According to the census of 1900 the population of the cities and large towns is rapidly increasing. The percentage over the census of 1890 shows how strongly the tide is setting from the farm to the city. The question of stemming this tide and setting it back towards the rural districts is occupying the minds of many thoughtful people, and many plans, more or less practical, are under discussion.

It is understood in this, as in all movements where social tendencies are to be checked or directed, that the only hopeful and permanent work must be done with the young. It is here that the country school must justify its existence by taking a different position and wielding a different influence in the rural community from what it has in the past. It has raised high the general standard of intelligence and it has accomplished much in the uplift of the race as a whole, but in so doing it has broadened the horizon of the country boy without any commensurate improvement in his immediate surroundings to keep him contented with his present life. It is here that it has failed in its ultimate mission. The country school is more and more adopting the ideals of the city instead of adapting them to rural communities. It is training our boys and girls for failure in the city rather than for success on the farm.

It is not necessary to force every boy to lead a farmer's life, but the nation would be more prosperous, happier and better if every boy had some elementary but definite knowledge of the processes of Nature; if he appreciated the dignity and beauty of a life spent in close contact with the soil, and if he realized the importance of that calling and the superior opportunities it offers for final and permanent success.

Beyond this the country school, through hitherto untried channels, can so direct the current of its influence that the community will demand and will obtain those conditions which make city life attractive, such as good roads, rural mail delivery, easy transit and a flourishing money market. These mean companionship instead of loneliness, comfort and beauty of surroundings instead of slovenly farms and wretched farmhouses.

The course in agriculture at the Farm School aims to give, in an elementary way, a definite technical and practical knowledge of the subject to every boy in the School. In the case of boys who go to the city, into offices, machine shops or other pursuits, we believe that this course will not only broaden their outlook upon life, but will be of actual value in whatever occupation they may follow. On the other hand, those who go to farms should be well prepared to take up the work with understanding, and to advance rapidly because of this training.

Attempts have been made in the past to build a course of study upon some one subject as a basis. Such attempts have failed in application partly because of the conditions under which they were developed, but largely because the subjects chosen did not furnish the proper material for solid foundations.

We have had in mind the environment of the Farm School in choosing Agriculture as the basis for a course, and have taken as a foundation study the occupation upon which human existence depends. It is the one subject which is neither the development nor the modification of the artificialities of human society, and because of this fundamental character it is especially fitted to support the structure of elementary education.

As it is the fundamental occupation of the race, from which other occupations have sprung, so it is the basal subject from which, at the call of human necessity, have sprung other subjects founded upon utility, and from them, in turn, as prosperity and leisure gave opportunity, have grown those subjects of cultural value.

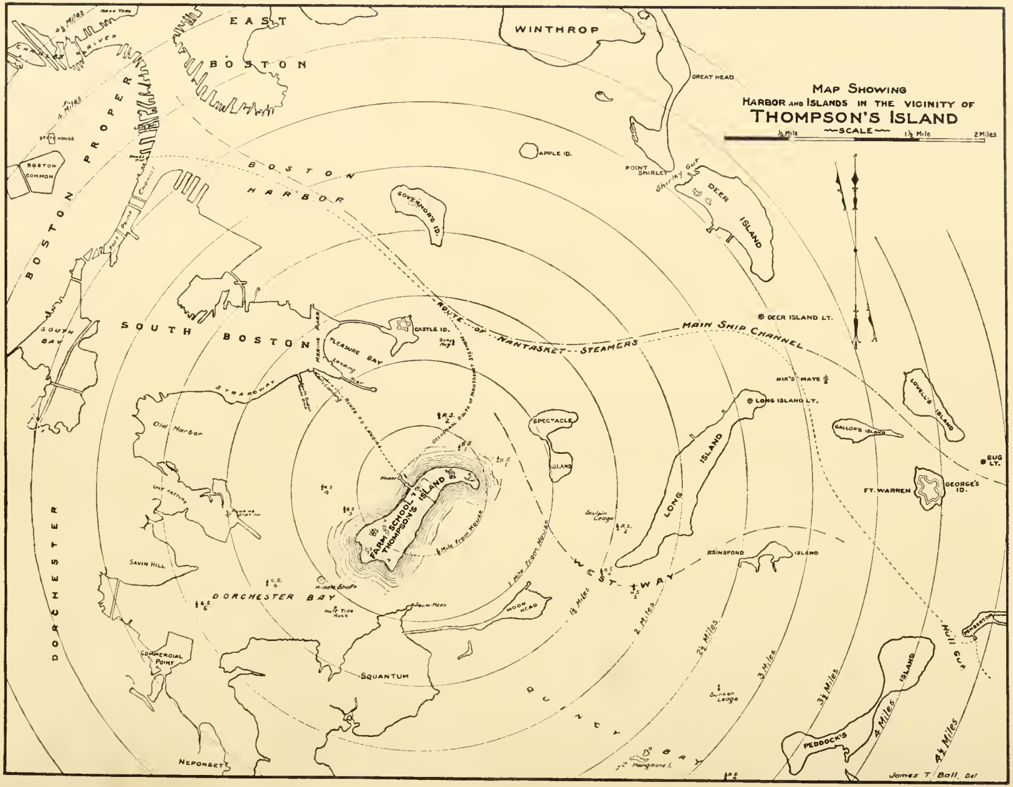
Agriculture furnishes ample material for arithmetic, and as the subject becomes interwoven with others, as the course develops, his material increases abundantly. The manual work in wood and metal is connected in a most practical way with the needs of the home, the pets and the playground, as well as of the farm. From the study of agriculture as an occupation, we turn naturally to other occupations of mankind, and to their variations in different countries. Thus the interests of the child run out in radial lines into remote corners of the earth. They become acquainted with strange peoples, their habits and customs, their relations with others, and the position they have occupied in the affairs of the world. Here we have sufficient basis for geography, commerce and history. It is but a step to the literature and art of a nation, and agricultural and pastoral life have contributed richly to our cherished masterpieces. Interwoven with all this material are constant opportunities for language work and inspirations for drawing, which appeal strongly to the child.

The following outline has been well tested at the Farm School, and for some time has been established as the basis of instruction. All other subjects are closely correlated with it, and a course is being worked out to show the relationship and development of these subjects under such a plan. In a mere outline it is impossible to convey satisfactorily the spirit of the instruction. It may tend toward the fixing of technical scientific facts and be dead, or it may arouse and encourage interest and love for the living plant and animal, and abound with life. At the Farm School the out-of-door interests of the boy are brought into the schoolroom, and as the points of contact increase, the life of the boy becomes the life of the school and the two are builded together into a symmetrical and enduring structure.

We believe that from original contact with nature flows the source-spring of the mental life-stream, and that such contact is invaluable because of its aesthetic, moral and ethical influence. However, we also believe that the utilitarian values have been too much overlooked or obscured in the past. Boys of twelve to sixteen years of age are quick to appreciate and to apply whatever appeals to them as practical, and it is this side of the subject which we try to emphasize in the application of this course, feeling sure that the higher appeals of Nature will force themselves upon the boy at the proper time in his development.

If it is better to train a boy to observe, to understand and to work with Nature in the furthering of her beneficent purposes; to arouse an enthusiasm for productive activity by the use of his hands in the shaping of wood and the working of metal; if it is better that he should love and care for all manner of living creatures; that he should learn self-government and respect for personal and property rights through actual activities of municipal and commercial life, and to use his books only to enable him to get a broader grasp of the theory of life than a wholly concrete training would give him,— if such training is better than the venerable traditions of education which still keep the great majority of boys and girls in a routine of book study for nearly the whole of their school hours, then the Thompson's Island Farm School must rank high in the educational world, and if the solution of the problems that are there being worked out in a decidedly original way are as successful as the present indicates, the result may have a decided influence upon the future development of our educational system.

JOHN C. ANTHONY,
Superintendent of Schools,
Wareham, Mass.



THOMPSON'S ISLAND AND VICINITY.

AGRICULTURE.

THE SOIL

1st. YEAR.

1. **ELEMENTARY GEOGRAPHY,** with reference to Agriculture.

Points of the compass and use. Direction of points in the schoolroom and distance to same. Direction of places on the Island and distance to same. Direction of islands, wharves and other points about the harbor and distance to same. (See map of Thompson's Island and Vicinity.)

Locate places on the horizon where the sun rises and sets and position of same at noon, with length of day and night throughout the year. (Note variations.)

Daily record of day,—date, frost or dew, direction of wind, clouds or fog, rain or snow, temperature, etc. Compare records of various months and seasons. Prevailing winds, cold or warm, wet or dry. Frost and snow as protection to life. Thunder storms and hailstones. Direction of heaviest rains, winds, etc. Morning and evening star. Rising of new, full and waning moon. Constant position of North Star, revolution of Great Bear around it, pointers in Great Bear. Effect of wind and clear and cloudy nights upon the formation of frost or dew. Note effect of temperature, course of sun, length of day, frost, winds, rain, etc., upon plant and animal life. Variation of plant and animal life throughout the year.

II. **SOIL.** Origin of soil,—decayed vegetation and disintegration of rock. Study of pebbles, coarse and fine sand, effect of water upon them. Compare sand and clay. Classify and compare as to physical properties and structure, sandstone and limestone, granite and marble, slate and different kinds of coal (color, texture, weight, tenacity). Study of soils,—sand, gravel, loam and clay, to be able to distinguish, to know in a simple way the physical characteristics, properties and origin. Value of soil in relation to life. Visit a stream or gutter made in sloping land, and during a heavy rain. Observe forces at work and results. Effect of ants and earthworms upon soil. Very simple explanations and few or no technical terms.

2ND. YEAR.

I. **ELEMENTARY GEOGRAPHY.** Daily record of day,– date, direction of wind, clouds or fog, rainfall, temperature, barometer. Evaporation,– dew, frost, rain. Condensation,– formation of rain, snow, hail, frost, dew, clouds. History of a rain drop. Different forms of clouds,– Cirrus, Cumulus, Stratus, Nimbus,– elevation of each. Variation of barometer and thermometer before, during and after a storm. Influence of April showers. Influence of mountain ranges and large bodies of water upon rainfall and temperature. Study signal service and other weather maps. Snow lines, isotherms, etc., on plains, mountains, and near the coast lines. Rotation and revolution of the earth, inclination of axis, day and night, change of seasons, autumnal equinox, winter solstice, spring equinox, summer solstice. Relative positions of earth and sun on September 21, December 21, March 21, June 21. Length of shadow on these days by the shadow stick. Little Bear, Jupiter, Venus, Mars, Mercury, apparent path of sun.

II. **SOIL.** Change of structure in earth's crust,– erosion, sedimentation, upheaval, denudation. Pebbles,– river, ocean, glacial, conglomerates. Character of soil in swamps and marshes. Much field observation throughout the year.

3RD. YEAR.

I. **ELEMENTARY GEOGRAPHY.** Continue daily records with comparisons and practical applications.

II. **SOIL.** What soil is, how made, methods of rock disintegration. Water-freezing and thawing, corrosion or weathering, displacement by streams. Action of glaciers, action of earthworms and animal and vegetable life in general in forming humus.

Texture of the soil, what it is, why important, how obtained and conserved. Moisture in the soil, why necessary, how held, how capacity may be increased, conservation of moisture.

Tillage, what it is, importance, what it does, how performed.

Enriching the soil,–farm resources, green-manures, stable-manures, other dressings,–commercial resources, fertilizers, what they are, when and how used.

Examine sands, gravel, loam, clay, make collections of soils and mixed soils, determine ingredients, make simple tests as to power of each to absorb and to retain moisture and heat. Nature of soil from different kinds of rock. Agents at work on rock and soil; sunshine, air, water (rain, streams and frost), life (plant and animal).

4TH. YEAR.

I. **ELEMENTARY GEOGRAPHY.** Continue daily records with comparisons and practical applications.

II. **SOIL.** Simple chemistry of the soil. Elements needed for various crops and how to supply them when missing. Fertilizers, history and care of same. Rotation of crops. Soil temperatures. Good tillage, why necessary, effects. Drainage. Improving wet soils, reclaiming swamps, depth of drains, distance apart. Irrigation,—benefits, dangers.

PLANT LIFE.

OUTLINE for GERMINATION of SEEDS & DEVELOPMENT of PLANT.

(To be adapted to work in all grades.)

I. The seed. Outer parts, inner parts, development of plantlet. Growth of roots, stem, leaves. Simple experiments to determine influence and importance of moisture, free oxygen, temperature, influence of light, various soils, etc.

II. Testing seeds.

III. Sowing of seeds. Effect of shallow and deep planting on different kinds of seeds, (experiments). Usual time of planting and harvesting different crops. Which planted in hills or drilled and tilled. Which sown broadcast or in close drills and not tilled.

IV. Plants. Life histories and work of plants. Vegetative parts of plant,—root, stem, leaves; reproductive parts,—flower, fruit. Annuals, biennials, perennials.

V. Uses of plants. Which used as food for man, horse, cow, sheep, swine, poultry, etc. Which used for seeds, fruits, leaves, stalks, roots, etc. Those valuable for sap. Plant as a soil-maker and retainer, influence on climate.

VI. During the course, study germination and development as arranged above. Study care, enemies, harvesting, storage. This work as outlined above is to be done as far as possible in the schoolroom, during the winter months, leaving the spring and summer free to study the same under normal conditions in the field, with an understanding of the necessity of everything that is to be done. This latter, practical part is the more essential.

STUDY OF PLANTS BY YEARS.

1ST. YEAR.	Pea, bean, corn, wheat, rye, oats.
2ND. YEAR.	Turnip, carrot, onion, lettuce, clover, grasses, cabbage, beet.
3RD. YEAR.	Tomato, squash, potato, egg plant, cucumber, melon.
4TH. YEAR.	Asparagus, celery, parsnip, salsify, artichoke.

OUTLINE of TREE STUDY for all GRADES, all TERMS.

Environment, shape, symmetry.

Parts of tree,—roots, stems and branches, bark, wood, buds (position and activity, covering, arrangement), leaves (arrangement, parts, venation, kinds, forms, natures).

In description of tree and in individual study of the tree, follow the outline given below. Have the boy take a copy of the outline (printed) and a note book, and take notes of his observations, following the outline closely. In his verbal report to the class, and in his written report to the teacher, he should follow the same outline, having it constantly before him. This method should be carefully taught, objectively, by the teacher to the whole class, in field work and in the class room before the boys work independently. Have trees studied throughout the year for changes.

This topical outline should be used much in language work as follows:—

1ST. YEAR. The mere filling out of the outline from observation of a single tree.

2ND. YEAR. A connected description of single tree in good English sentences.

3RD. YEAR. A connected description of certain *kind* of tree from observation of *many trees of the species.*

4TH. YEAR. A formal essay to include all possible outside information, from reference books, as well as description from observation, as outlined under "3rd. Year."

OUTLINE FOR DESCRIPTION.

Tree as a whole,– size, general form, trunk, branching, twigs, character of bark, color of bark on trunk, branches, twigs.

Leaves,– parts, arrangement, kinds, size, thickness, form, edges, venation, color, surface, duration, usefulness.

Buds,– position, size, form, covering, number, color.

Sap and juice.

Flowers,– size, shape, color, parts, odor, position, time of blooming, duration.

Fruit,– size, kind, form, color when young and when ripe, time of ripening, substance, seeds, duration, usefulness.
Wood,– hardness, weight, color, grain, markings, durability, usefulness.
Remarks,– peculiarities not brought out by above.

TREE STUDY BY YEARS.

1ST. YEAR. Horse chestnut, maple, spruce, oak, hickory, pine, linden.
2ND. YEAR. Fir, willow, sycamore, poplar, hemlock, elm.

3RD. YEAR.
4TH. YEAR. } Fruit trees and shrubs as below.

3RD. AND 4TH. YEARS. 1ST. AND 2ND. TERMS.

PROPAGATION.

A. By Seeds—Seedage.

B. By Buds
- On their own roots
  - By undetached parts
    - Root tips
    - Layers
    - Runners
  - By detached parts
    - Undivided parts
      - bulbs
      - tubers
    - Divided parts cuttings of
      - stem
      - root
      - leaves
      - tubers
- On roots of other plants
  - Detached scions
    - Budding
    - Grafting
  - Undetached scions—Inarching.

Varieties suited to different climates and soil. Drying and preserving fruits.

1ST. AND 4TH. TERMS.

Fruit Tree Management. Planting, pruning, cultivating, watering. Care during the first year,—top pruning, management of old trees, pruning, grafting, scraping. Diseases, vegetable and animal. Enemies, their prevention. (See under Animal Life).

ANIMAL LIFE.

INSECTS, BIRDS AND ANIMALS.

EACH YEAR, ALL SEASONS.

Keep Natural History Calendar, making notes of arrival and departure of insects and birds, change in appearance or forms, etc., changes in coats, etc.

INSECTS.

IN ORDER AS INSECTS APPEAR.

Children should become acquainted with the life histories of insects and whether they are beneficial or injurious. Study by observation under normal conditions, and confined specimens in the schoolroom, in cage or aquariums.

Place of insects in animal kingdom.

Parts of an insect,– head, thorax, abdomen.

Metamorphosis of insects.

Economic relations. Effects, warfare against insects, mechanical methods, insecticides, spraying.

Injurious insects. Apple pests, plum pests, peach pests, celery pests, grape pests, currant pests, raspberry and blackberry pests, potato pests, tomato pests, cabbage and cauliflower pests.

Some of Nature's insecticides,– wind, temperature, rain, fires, birds, predaceous insects, ichneumon flies, spiders, frogs, toads, ladybugs, snakes.

This work to be divided as far as possible so that the technical part may be done in the schoolroom and the practical part may come during the latter part of the course, with careful study of the mechanical methods of insecticides, and practice in spraying. In the study of insects note the time of appearance, protective coloration, food, manner of feeding, enemies, stages of growth, etc. Do not neglect the grasshopper, ant, etc. Bring an ant's nest into the schoolroom, as suggested in Bulletin No. 63.

1ST. AND 2ND. TERMS.

The first year distinguish between vertebrated, molluscous, articulated and radiated animals. Familiar examples of each, as bird or fish, oyster or clam, insects, star fish, etc.

The second year take the earthworms, snails, frogs, toads, etc. As far as possible have specimens in the schoolroom, and study habits, life history, etc.

BIRDS.

EACH YEAR. ALL SEASONS.

1. Relations of birds to man,– scientific, economic, aesthetic.
2. Outline for indentification,– size (compare with English sparrow or robin, as the most familiar birds), color, markings, shape (body, wing, bill, tail, feet, movements, flight).
3. Parts of a bird, (head, body, wings, legs).
4. Bird music.
5. Color of birds,– variation of color, in relation to haunts and habits, sexual differences, relation to nesting habits, form of nest, relation to song.
6. Food,– kinds and manner of obtaining.
7. Insect-eating birds and their prey.
8. Nesting habits of birds,– location of nest, structure, eggs, care of young.
9. Migration,– records.
10. Classification.

Aim to stimulate effort and enthusiasm of individual pupil. The study of one pair of birds by each pupil may accomplish more along this line than the study of many by the class, especially as each scholar can report to the whole class on *his* pair of birds. This would be an excellent language exercise.

Encourage the boys to make boxes and nesting places, to supply food in bad weather, etc. Discourage all egg collecting or desire for collection of stuffed birds. Make the living, moving, singing bird the object of supreme interest. The following birds are selected for study the first two years, with constant reference and practical observation in the field work of the last two years. This same plan followed with insects, birds, etc., will keep the boy with eyes wide open, constantly alert to discover any form which is injurious or beneficial to the production of crops.

The following birds should receive especial attention,—

Sparrow, robin, crow, blackbird, catbird, bluebird, woodpecker, thrush, chickadee, wren, bluejay, oriole, lark, bobolink, quail, etc. Transient visitors in passage should not be neglected, and should be noted in the Natural History Calendar. Water birds and shore birds should receive attention.

4TH. YEAR. 3RD. TERM.

The farm poultry may well be left until the latter part of the course, when detailed and definite instruction is to be given to breeding for various purposes, care, management, feeding, housing, sanitation, enemies, diseases, etc.

ANIMALS.

In addition to the work necessarily outlined under other heads take the following:—

1ST. YEAR. Study cat,dog, sheep, horse, cow, pig. Compare coat as to texture, color, distribution, warmth and protection. Preparation for winter and spring. Compare as to movements, means of getting food, means of protection, use to man. Compare teeth of each with human teeth and relate to kinds of food. Manner in which each takes food.

2ND. YEAR. Squirrel, rabbit, Guinea pig. Compare coats as above, habits, food, manner of eating, protective coloration, etc. Compare teeth and food with dog and cat and of each with man.

Relate coloration of animals to environment, protection, attraction, food getting. Frog, toad, polar bear, wild cat, leopard, tiger, etc.

Compare teeth, hoofs and claws of rodents, carnivorous, herbivorous and omnivorous animals. Coverings of animals, change of seasons, value of skins, hair, wool, etc., in commercial world.

3RD. AND 4TH. YEARS. Care, food, management, housing, sanitation, etc., of horse, cow, pig and sheep. Special study of cow. Dairying. Milking, care of milk and utensils, milk records, cream, butter and cheese making, etc.

CARE AND MANAGEMENT OF COWS.

4TH. YEAR 3RD. TERM.

I. Uses of the animal. A beast of burden. As food for man. Its products as a food for man. A soil improver. It disposes of various crops.

II. A. Feeding. Consider age of animal. What food is and what it does. Sources of food. Food for summer,—pasture, soiling, crops, grain. Food for winter,—hay, straw, fodder, ensilage, roots. Grain,—whole, ground, by products. Cooked or uncooked foods. Time, frequency of feeding and amount.

B. Watering. Warm or cold water.

C. Grooming.

D. Housing. Consider health and comfort of animal.

III. Breeding. Why we raise stock. When to buy. Breeds,—breeds for milk, butter or beef. Amount of stock to be kept.